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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Euan C. Smith

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EXAMINER

MACCHIAROLO, PETER J

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/587,602	Applicant(s) SMITH, EUAN C.	
	Examiner PETER J. MACCHIAROLO	Art Unit 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 June 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/06/2006, 07/28/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

The information disclosure statements (IDS) submitted on 07/28/2006 and 11/06/2006 are in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statements are being considered by the examiner.

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the plurality of pixels each comprising at least two different-colored subpixels (see at least claim 1), and corresponding transistors (see at least claim 8) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must

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be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

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Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(a) and 102(e) as being anticipated by Tyan et al. (USPN 6693296: “Tyan”).

Regarding claim 1, Tyan discloses at least in fig. 4 an organic light emitting diode (OLED) display device, the display device having a plurality of pixels (32, 34, 36, 38) each comprising at least two sub-pixels (the first subpixel being 32a, the second subpixel being 32b and 32c) of different types, a first sub-pixel type (32a) comprising an OLED device (32a) including a first type of OLED material (42a) and a second sub-pixel type (the combination of 32b and 32c) comprising an OLED device (32b and 32c) including a second type of OLED material (42b), and wherein at least one of said first and second types of sub-pixel comprises a plurality of series-connected OLED devices (32b and 32c).

Claims 1 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Applicant cited Ishizaki et al. (JP 2000029404: “Ishizaki”).

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Regarding claims 1 and 15, Ishizaki discloses at least in figs. 1-3 and the abstract a color active matrix OLED display having a plurality of pixels, each pixel comprising a red sub-pixel, a green sub-pixel, and a blue sub-pixel powered from a common supply line and having an associated sub-pixel driver transistor (i.e. active matrix), at least one of said red, green and blue sub-pixels comprising two or more series connected organic light emitting diodes (OLEDs).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanaka et al. (USPN 6107734: “Tanaka”).

Regarding claims 1 and 14, Tanaka discloses at least in figs. 1 and 2 an organic light emitting diode (OLED) display device, the display device having a plurality of subpixels (6) of different types (see at least col. 6, ll. 42-47), a first sub-pixel type comprising an OLED device (5 at e,m,n) including a first type of OLED material (see at least col. 6, ll. 42-47) and a second sub-pixel type comprising an OLED device (5 at e,m+1,n) including a second type of OLED material (see at least col. 6, ll. 42-47), and wherein at least one of said first and second types of sub-pixel comprises a plurality of series-connected OLED devices (see at least fig. 1, stacked elements 5 in subpixel 6 are connected in series via element 4).

Tanaka does not expressly disclose each pixel comprises at least two subpixels.

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However, Tanaka does infer this configuration since figure 1 is described as showing an full color organic EL display, and one skilled in the art will understand that a full color organic EL display is required to have pixels each comprising at least two sub-pixels of different colors. Furthermore, Tanaka's figure 1 appears to show a typical and known arrangement for a full color pixel, i.e. four different colored subpixels which make up one full color pixel.

Even if Tanaka did not infer this configuration the Examiner hereby takes official notice that this modification is well-known to one skilled in the art, and one would be capable of modifying Tanaka's invention to allow for one pixel comprising at least two different colors of sub-pixels to produce a full color display.

Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct Tanaka's device wherein each pixel comprises at least two subpixels since Tanaka infers this configuration, and one skilled in the art would modify Tanaka's reference to allow for a well-known full color display.

Regarding claim 2, Tanaka discloses at least in figs. 1 and 2 a said pixel has a common power supply line (one of elements 2) for supplying power to said at least two sub-pixels (6).

Regarding claim 3, Tanaka discloses at least in fig. 1 at least said first type of sub-pixel comprises series connected devices.

Tanaka is silent to said first type of OLED material having a lower drive voltage than an OLED device including said second type of OLED material.

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However, the Examiner hereby asserts that one skilled in the art will realize this is an inferred driving configuration of the overall structure of the device and this will allow for a large sized display with reduced scanning line current.

Regarding claim 4, Tanaka discloses at least in fig. 1 each of said plurality of series connected devices (5) has substantially the same light emissive area.

Regarding claim 5, Tanaka discloses at least in col. 6, ll. 42-47 said first and second types of OLED material have different peak emission wavelengths.

Regarding claim 6, Tanaka is silent to said pixel comprises three sub-pixels of different types, a said pixel including a third sub-pixel type comprising an OLED device including a third type of OLED material.

However, Tanaka does infer this configuration since figure 1 is described as showing an full color organic EL display, and one skilled in the art will understand that a full color organic EL display is required to have pixels each comprising three sub-pixels of different types, a said pixel including a third sub-pixel type comprising an OLED device including a third type of OLED material. Furthermore, Tanaka's figure 1 appears to show a typical and known arrangement for a full color pixel, i.e. four different colored subpixels which make up one full color pixel.

Even if Tanaka did not infer this configuration the Examiner hereby takes official notice that this modification is well-known to one skilled in the art, and one would be capable of

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modifying Tanaka's invention to allow for one pixel comprising at three different colors of sub-pixels to produce a full color display.

Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct Tanaka's device with three sub-pixels of different types, a said pixel including a third sub-pixel type comprising an OLED device including a third type of OLED material to allow for a full color display.

Regarding claim 7, Tanaka discloses at least in fig. 1 at least two of said sub-pixel types comprise a plurality of series-connected OLED devices (see also col. 6, ll. 26-48).

Regarding claim 8, Tanaka teaches that TFT's have been used in the prior art for better control of each subpixel, however is silent to a drive transistor associated with each sub-pixel of the invention.

However, the Examiner hereby takes official notice that one skilled in the art can modify Tanaka's passive matrix display to include TFT's, thereby yielding an active matrix display which is known to have better control over each subpixel. Even though this modification would increase the cost of the overall device, one skilled in the art will understand the light emitting device will have better overall performance and control of the pixels, thereby appealing to specific market conditions.

Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the device of Tanaka with a drive transistor associated with each sub-pixel of the invention, since this modification will

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yield a device with better overall performance and control of the pixels, thereby appealing to specific market conditions.

Regarding claims 9 and 17, Tanaka discloses and teaches all of the limitations therein, with the exception of the series-connection configuration of OLED devices of said first and second sub-pixel types are determined by a supply or operating voltage for which the display device is designed.

However, one skilled in the art will realize that this is a required configuration when designing an operational full color display device and an obvious method in light of the resultant structure.

Further, the Examiner notes that this limitation provides very little structural detail of the device, and one skilled in the art will arrive at the implied structure in view of the teachings of Tanaka for proper operational requirements.

Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct Tanaka's device with a series-connection configuration of OLED devices of said first and second sub-pixel types is determined by a supply or operating voltage for which the display device is designed.

Regarding claims 10 and 11, it appears that Tanaka discloses at least in EXAMPLE 4 that the first and second types of OLED material are fluorescent and phosphorescent respectively.

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However, even if Tanaka did not disclose this configuration, the Examiner asserts that this is an obvious configuration to one skilled in the art since it is well known that this material configuration will optimize the light efficiency with total power consumption.

Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct the first and second types of OLED material are fluorescent and phosphorescent respectively to optimize the light efficiency with total power consumption.

Regarding claims 12 and 13, Tanaka discloses at least in at least col. 8, ll. 24-37 and EXAMPLE 4 the first type of OLED material comprises a polymer material and the second type of OLED material comprises a dendrimer OLED material or small molecule OLED material.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ishizaki.

Regarding claim 16, Ishizaki does not explicitly disclose the color active matrix OLED display as claimed in claim 15 wherein power requirements of said red, green and blue sub-pixels are balanced such that a power requirement of a said pixel including said associated sub-pixel driver transistors, with said red, green and blue sub-pixels illuminated, is less than a power requirement a said pixel would have for substantially the same perceived brightness were none of said sub-pixels to comprise series-connected OLEDs.

However, one skilled in the art will realize that this is a required configuration when designing an operational full color display device and an obvious method in light of the resultant structure.

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Further, the Examiner notes that this limitation provides very little structural detail of the device, and one skilled in the art will arrive at the implied structure in view of the teachings of Tanaka for proper operational requirements.

Therefore, in view of the above discussion, it would have been obvious to one having ordinary skill in the art at the time the invention was made to construct Ishizaki's device with a series-connection configuration of OLED devices of said first and second sub-pixel types is determined by a supply or operating voltage for which the display device is designed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter J Macchiarolo whose telephone number is (571) 272-2375. The examiner can normally be reached on 8:30 - 5:00, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar Patel can be reached on (571) 272-2475. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

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system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Respectfully submitted,

/Peter Macchiarolo/
Primary Examiner, Art Unit 2879
(571) 272-2375